at1121exam_practice EXAMPLE! DO NOT HAND IN FOR CREDIT (v14)

- If you are looking for a practice exam that you can hand in for credit:

https://chadworley.github.io/algtwo2026/u04/1121/at1121exam/at1121exam.html

Question 1

Simplify the radical expressions.

$\sqrt{8}$ $\qquad$ $\sqrt{18}$ $\qquad$ $\sqrt{20}$

$\sqrt{2 \cdot 2 \cdot 2}$ $\qquad$ $\sqrt{3 \cdot 3 \cdot 2}$ $\qquad$ $\sqrt{2 \cdot 2 \cdot 5}$

$2\sqrt{2}$ $\qquad$ $3\sqrt{2}$ $\qquad$ $2\sqrt{5}$

Question 2

Find all solutions to the equation below:

$$6(x+9)^2 - 5 \;=\; 91$$

First, add 5 to both sides.

$$6(x+9)^2 = 96$$

Then, divide both sides by 6.

$$(x+9)^2 = 16$$

Undo the squaring. Remember the plus-minus symbol.

$$x + 9 = \pm 4$$

Subtract 9 from both sides.

$$x = -9 \pm 4$$

So the two solutions are $x = -5$ and $x = -13$.

Question 3

By completing the square, find both solutions to the given equation. *You must show work for full credit!*

$$x^2 + 6x = 40$$

Take the linear coefficient, 6, halve it and square the result. You should get 9. Add this to both sides of the equation to complete the square.

$$x^2 + 6x + 9 = 40 + 9$$

$$x^2 + 6x + 9 = 49$$

Factor the perfect-square trinomial.

$$(x + 3)^2 = 49$$

$$x + 3 = \pm 7$$

$$x = -3 \pm 7$$

$$x = 4 \quad \text{or} \quad x = -10$$

Question 4

A quadratic polynomial function is shown below in standard form.

$$y = 2x^2 - 24x + 80$$

Express the function in **vertex form** and identify the **location** of the vertex.

From the first two terms, factor out 2 .

$$y = 2(x^2 - 12x) + 80$$

We want a perfect square. Halve -12 and square the result to get 36 . Add and subtract that value inside the parentheses.

$$y = 2(x^2 - 12x + 36 - 36) + 80$$

Factor the perfect-square trinomial.

$$y = 2((x - 6)^2 - 36) + 80$$

Distribute the 2.

$$y = 2(x - 6)^2 - 72 + 80$$

Combine the constants to get **vertex form**:

$$y = 2(x - 6)^2 + 8$$

The vertex is at point $(6, 8)$.